

Alg. 2 Warm Up #10-3

Factor completely:

1. $25x^2 - 1$

2. $5x^3 - 125x$

3. $x^2 + x - 72$

4. $x^3 - 3x^2 - 18x$

HW Questions:

Preview

3-102. Estacia wants to learn more about excluded values.

- Explain to Estacia why x cannot be 4 in the expression $\frac{x+2}{x-4}$.
- Find the excluded values of x in each of the expressions of problem 3-99.
- Create an expression that has the excluded values of $x \neq -6$ and $x \neq \frac{1}{3}$. Be prepared to share your expression to the class.

$$x + 6$$

3-103. Use the methods developed in class to add or subtract the following rational expressions. Be sure to look for factors before trying to determine a common denominator, and simplify your answers, if possible.

a.

$$\frac{4x}{x^2 - 2x - 8} + \frac{4}{(x-4)(x+2)}$$

$(x-4)(x+2)$

$$LCD = (x-4)(x+2)$$

b.

$$\frac{16x - 12}{4x^2 + 5x - 6} - \frac{3}{x+2}$$

$(4x-3)(x+2)$

$$LCD = (4x-3)(x+2)$$

Multiply 2nd
fraction by
 $\frac{(4x-3)}{(4x-3)}$

3-104. Solve the equations and inequalities below. Check your solutions, if possible.

a. $|5x+8| \geq -4$

c. $2x^2 - 6x = -5$

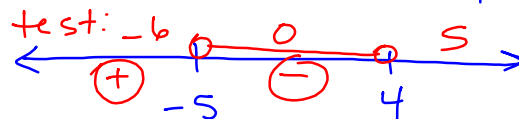
b. $x^2 + x - 20 < 0$

d. $\frac{5}{9} - \frac{x}{3} = \frac{4}{9}$

$$(x+5)(x-4) < 0$$

* looking for a product less than zero
(negative)

critical Numbers: -5 ; 4



$$(-6+5)(-6-4) \stackrel{?}{<} 0$$

$(-)(-)$ is positive
so didn't work

||
()

$$(0+5)(0-4)$$

$(+)(-)$

✓

$$\boxed{-5 < x < 4}$$

3-104. Solve the equations and inequalities below. Check your solutions, if possible.

a. $|5x+8| \geq -4$

b. $x^2 + x - 20 < 0$

c. $2x^2 - 6x = -5$

d. $9\left(\frac{5}{9} - \frac{x}{3}\right) = \frac{4}{9} \cdot 9$

$2x^2 - 6x + 5 = 0$
doesn't factor so:

$5 - 3x = 4$
:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{6 \pm \sqrt{(-6)^2 - 4(2)(5)}}{2(2)}$$

$$x = \frac{6 \pm \sqrt{-4}}{4}$$

No Sol.

3-105. Simplify the rational expressions below as much as possible.

a. $\frac{(x-4)^3(2x-1)}{(2x-1)(x-4)^2}$

b. $\frac{7m^2 - 22m + 3}{3m^2 - 7m - 6}$

c. $\frac{(z+2)^9(4z-1)^7}{(z+2)^{10}(4z-1)^5}$

d. $\frac{(x+2)(x^2-6x+9)}{(x-3)(x^2-4)}$

3-106. Lexington High School has an annual growth rate of 4.7%. Three years ago there were 1500 students at the school.

(a) How many students are there now?

b. How many students were there 5 years ago?

c. How many students will there be n years from now?

$x = -3$
 $\rightarrow 100\% + 4.7\% = 104.7\%$
Multiplier = 1.047
 $1500 = a(1.047)^{-3}$
Solve for a

3-107. Multiply or divide the expressions below. Leave your answers as simplified as possible.

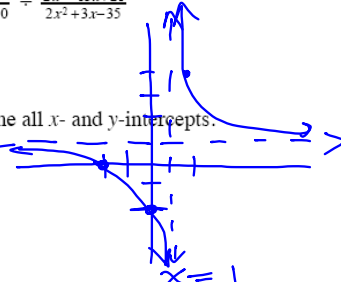
a. $\frac{(3x-1)(x+7)}{4(2x-5)} \cdot \frac{10(2x-5)}{(4x+1)(x+7)} = \frac{10(3x-1)}{4(4x+1)}$ b. $\frac{(m-3)(m+11)}{(2m+5)(m-3)} \div \frac{(4m-3)(m+11)}{(4m-3)(2m+5)}$

c. $\frac{2p^2+5p-12}{2p^2-5p+3} \cdot \frac{p^2+8p-9}{3p^2+10p-8}$ d. $\frac{4x-12}{x^2+3x-10} \div \frac{2x^2-13x+21}{2x^2+3x-35}$

3-108. Graph the function $g(x) = \frac{x+2}{x-1}$ on graph paper and name all x- and y-intercepts. What happens at $x=1$?

$$g(2) = \frac{2+2}{2-1} = 4$$

$$y=1$$



3-109. If $f(x) = 3x - 9$ and $g(x) = -x^2$, find:

a. $f(-2)$

b. $g(-2)$

c. x if $f(x) = 0$

d. $g(m)$

$$3x - 9 = 0$$

$$0 = \frac{x+2}{x-1}$$

$$0 = x+2$$

107 c)

$$\frac{(2p-3)(p+4)}{(2p-3)(p-1)} \cdot \frac{(p-1)(p+9)}{(3p-2)(p+4)}$$

$$\frac{p+9}{3p-2}$$

From the yellow CP's: #87

e) $\frac{5 \cancel{15} x^3}{\cancel{3} y} \div \frac{\cancel{10} x^2 y}{\cancel{2} 4 y}$

$$\frac{\cancel{5} x^3}{\cancel{y}} \cdot \frac{\cancel{2} y}{\cancel{5} x^2}$$

$$\frac{x \cdot 2}{1}$$

$$\boxed{2x}$$

From the yellow CP's: #87

$$e) \frac{\cancel{5} 15x^3}{\cancel{3}y} \div \frac{\cancel{5} 10x^2y}{\cancel{2}4y^2}$$

$$\frac{5x^3}{y} \div \frac{5x^2}{2y}$$

$$\frac{5x^3}{y} \cdot \frac{2y}{5x^2}$$

$$\frac{\cancel{5} 10x^3 \cancel{y}}{\cancel{5} x^2 \cancel{y}}$$

$$\frac{2x^3}{x^2}$$

$$\boxed{2x}$$

From yesterday's CP's:

$$3-100 \text{ ab)} \frac{(x-1) \cdot 2x-1}{(x-7) \cdot (3x+1)(x+4)} + \frac{(x+3)(3x+1)}{(x^2-3x-28)(x+7)}$$

$$\text{LCD: } (3x+1)(x+4)(x-7)$$

$$\frac{(2x-1)(x-7) + (x+3)(3x+1)}{(3x+1)(x+4)(x-7)}$$

$$\frac{2x^2 - 14x - 7 + 3x^2 + x + 9x + 3}{(3x+1)(x+4)(x-7)}$$

$$= \frac{5x^2 - 5x + 10}{(3x+1)(x+4)(x-7)}$$

$$= \frac{5(x^2 - x + 2)}{(3x+1)(x+4)(x-7)}$$

$$= \frac{5(x+1)(x-2)}{(3x+1)(x+4)(x-7)}$$

From yesterday's CP's:

$$3-100 \text{ ab) } \frac{(x-7)(2x-1)}{(x-7)(3x+1)(x+4)} + \frac{(x+3)(3x+1)}{(x+4)(x-7)(3x+1)}$$

$$\text{LCD: } (3x+1)(x+4)(x-7)$$

$$\frac{2x^2 - x - 14x + 7 + 3x^2 + x + 9x + 3}{(3x+1)(x+4)(x-7)}$$

$$\frac{5x^2 - 5x + 10}{(3x+1)(x+4)(x-7)}$$

$$\boxed{\frac{5(x^2 - x + 2)}{(3x+1)(x+4)(x-7)}}$$

$$3-100c) \quad \frac{2}{x+4} - \frac{4x-x^2}{x^2-16}$$

CP: 3- #110

3.2.5 Pulling it all together

Creating New Functions



In this lesson you will use all four operations of arithmetic to combine rational expressions. As you work with your team on the problems consider the following questions:

What operation are we using here and what steps will we need to take?

Is it possible to factor the numerators or denominators of the expressions?

How can we use the multiplication property of the “Giant One”?

What values of x must be excluded? How will that affect the graph?

Is our answer a rational expression?

3-110. PULLING IT ALL TOGETHER

You now know how to add, subtract, multiply, and divide rational expressions. Pull this all together by simplifying the following expressions.

a. $\frac{2x^2+x}{(2x+1)^2} - \frac{3}{2x+1}$

b. $\frac{x^2-3x-10}{x^2-4x-5} \div \frac{x^2-7x-18}{2x^2-5x-7}$

c. $\frac{15x-20}{x-5} \cdot \frac{x^2-2x-15}{3x^2+5x-12}$

d. $\frac{4}{2x+3} + \frac{x^2-x-2}{2x^2+5x+3}$

e. $\frac{6x-4}{3x^2-17x+10} - \frac{1}{x^2-2x-15}$

f. $\frac{x^2-x-2}{4x^2-7x-2} \div \frac{x^2-2x-3}{3x^2-8x-3}$

#110 Answers:

a)

b)

c)

d)

e)

f)

HW: 3 -

113 ---> 121,
skip # 119

Test Ch. 3
Tuesday

Short Quiz Thursday:
Factor Completely
Solve a System
Simplify Exponents